WHAT IS CLAIMED IS:

1. A pattern reading apparatus, comprising:

a minute-area light source that causes an illumination light beam to be incident on an object surface having a pattern formed thereon as an object to be read;

an objective lens that converges a light beam carrying the information of the pattern;

a spatial filter positioned such that a size of an image of said light source formed by said objective lens is smaller than a size of the image at a paraxial image point, said spatial filter having a shading region that shades a portion of the light beam that forms an image of said light source from the light beam; and

an imaging lens that forms the image of the pattern using the light beam that passes through said spatial filter.

2. The pattern reading apparatus according to claim 1, wherein the shading region of said spatial filter shades a non-diffusing component of said light beam from the object surface and causes a diffusing component of said light beam from the object surface to pass through said spatial filter.

3. A pattern reading apparatus according to claim 1, wherein a distance L from said spatial filter to a surface of said objective lens nearest to said spatial filter satisfies the condition $0.06fo < L < 0.95fo$, where fo represents the focal length of said objective lens.

4. The pattern reading apparatus according to claim 1, wherein said spatial filter is positioned such that the size of the image of said light source formed by said objective lens is minimized.

5. The pattern reading apparatus according to claim 1, wherein said object surface is a reflection surface, said light source is positioned such that the illumination

light beam emitted from said light source reaches the object surface through said objective lens and the light beam reflected at the object surface passes through said objective lens to be incident on said spatial filter.

6. The pattern reading apparatus according to claim 5, wherein said objective lens is positioned such that an optical axis of said objective lens is perpendicular to the object surface, and wherein said light source and said imaging lens are disposed on opposite sides of the optical axis.

7. The pattern reading apparatus according to claim 6, further comprising an imaging element positioned at the imaging position of the pattern for reading the image of the pattern.

8. The pattern reading apparatus according to claim 7, said objective lens being positioned such that a light beam from a point on the object surface is emitted from said objective lens as a non-parallel light beam, said imaging lens and said imaging element being movable along an optical axis of said imaging lens to change a magnification.

9. A pattern reading apparatus, comprising:

a minute-area light source that causes an illumination light beam to be incident on an object surface having a pattern formed thereon as an object to be read;

an objective lens that converges a light beam having the information of the pattern;

a spatial filter disposed nearer to said objective lens than a paraxial image point of the image of said light source and having a shading region for shading the light beam to form the image of said light source which is contained in the light beam having passed through said objective lens; and

an imaging lens that forms the image of the pattern from the light beam having

passed through said spatial filter.

10. The pattern reading apparatus according to claim 9, wherein the shading region of said spatial filter shades a non-diffusing component of the light beam from the object surface and causes a diffusing component of the light beam from the object surface to pass therethrough.

Sub a4

11. The pattern reading apparatus according to claim 9, wherein the distance L from said spatial filter to the surface of said objective lens nearest to said spatial filter satisfies the condition $0.06fo < L < 0.95fo$, where fo represents the focal length of said objective lens.

12. The pattern reading apparatus according to claim 9, wherein the object surface is a reflection surface and said light source is positioned such that the illumination light beam emitted from said light source reaches the object surface through said objective lens and the light beam reflected at the object surface passes through said objective lens and is incident on said spatial filter.

Sub a5

13. A pattern reading apparatus, comprising:

a minute-area light source;

an objective lens that makes an illumination light beam from said minute-area light source incident on an object surface having a pattern formed thereon as an object to be read and converges a light beam reflected at the object surface;

a spatial filter, disposed nearer to said objective lens than a paraxial image point of said light source formed through said objective lens, the spatial filter capturing a diffused reflected component of the light beam which is contained in the reflected light beam having passed through said objective lens;

an imaging lens that forms, at an imaging position, an image of the pattern from the component of the light beam having passed through said spatial filter; and

an imaging element disposed at the imaging position of the pattern image that reads the pattern.

14. The pattern reading apparatus according to claim 1, wherein said spatial filter has a shading region that shades a light beam for forming the image of said light source.

15. A pattern reading apparatus using a Fourier conversion optical system, the pattern reading apparatus comprising: a first lens, an object surface to be read, a second lens, a spatial filter, and an imaging surface, all disposed along a traveling direction of a light beam from a light source, wherein the spatial filter is positioned nearer to the second lens than a back focal point of the second lens.

Add A4